Financial Intermediary Distress in the Republic of Korea: Small is Beautiful?[1]

by

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Abstract

Taking the Korean experience as a laboratory experiment of a systemic financial crisis, we analyze individual distress for two groups of financial intermediaries. We pool together a group of larger-sized financial intermediaries (commercial banks, merchant banking corporations) and a group comprising all the tiny-sized mutual savings and finance companies (MSFCs). Both the Too-Big-To-Fail Doctrine and the Credit Channel approach suggest that the probability of distress be larger for the small-sized intermediaries. On the contrary, we find that the percentage of distressed institutions was smaller among the MSFCs than in the group of larger-sized intermediaries.

We argue that this unexpected result might stem from two alternative hypotheses. First, it might derive from the fact that exchange rate exposure—a major shock to Korean intermediaries—was presumably negligible for MSFCs. Second, the result might originate from a better allocation of loans for MSFCs thanks to the "peer monitoring" elicited by their mutual nature and deep local roots. While available data do not allow us to test the former hypothesis, we find support for the latter. Specifically, estimating a logit model, we uncover that the probability of distress was systematically smaller for those MSFCs that kept closer to their origins—e.g. collecting a larger share of deposits in the form of "credit mutual installment savings"—and for those with longer business history in their local communities.

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[1] This study is based on evidence for Korea on MFSCs' and other financial intermediaries' distress up to mid-1999. After completing this paper, the authors became aware that many MSFCs are showing increasing non-performing loan ratios. Accordingly, the results based on the evidence up to mid-1999 might change. Even in this case, however, it would be difficult to disentangle whether the different performance of MSFCs with respect to other financial intermediaries was caused by bad allocation of credit or whether it was the result of lack of support by the public sector, contrary to what happened for other financial intermediaries.

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1 Introduction

The Korean financial crisis implied a large number of distressed intermediaries clustered within a short span of time. As such, the Korean experience provides a unique laboratory experiment to assess the determinants of financial institution distress in a systemic crisis.

Specifically, we want to test whether there is any support for the commonly held tenet that smaller-sized financial intermediaries are more likely to (be let) fail. This is a tenet one can derive from both the Too-Big-To-Fail Doctrine and the Credit Channel approach. On the one hand, the former doctrine postulates that larger-sized financial institutions will less likely fail since authorities—judging such failure would be too costly—will probably intervene to salvage these institutions if they run into trouble. On the other hand, the credit channel approach posits that smaller-sized financial institutions will more likely stumble upon liquidity problems, which may then bring them to fail.

In order to perform this test, we analyze individual distress for a pooled sample including two groups of Korean financial intermediaries: (i) a group of larger-sized financial intermediaries (commercial banks and merchant banking corporations), and (ii) a group comprising all the tiny-sized mutual savings and finance companies (MSFCs). Our expectation is that—in conformity with the above tenet—the probability of failure should be larger for the small-sized intermediaries of the latter group. On the contrary, we find that the percentage of distressed institutions was smaller among the MSFCs than in the group of larger-sized intermediaries.

To account for this unexpected result we evaluate two alternative hypotheses. The first hinges on the less risky intermediation performed by the MSFCs: namely, exchange rate exposure was presumably negligible for these intermediaries, thus sparing MSFCs a major shock that hit the other Korean intermediaries. The second hypothesis attributes the MSFCs' relative resilience to the crisis to their mutual nature and deep local roots, which—enhancing their ability to screen and monitor borrowers—would bring about a better allocation of loans for MSFCs.

Due to data availability, we cannot run a direct test for the first hypothesis as we, instead, can do for the second hypothesis. The results of this test lend support to the second hypothesis. Specifically, estimating a logit model, we uncover that the probability of distress is systematically smaller for those MSFCs that kept closer to their origins—e.g. collecting a larger

share of deposits in the form of "credit mutual installment savings"—and for those with longer business history in their local communities.

The rest of the paper is organized as follows: section 2 provides the motivation, offers a brief review of the relevant literature on financial institutions' distress and on why we may expect small banks to be more prone to fail. Section 3 provides a characterization of the specific nature of Korean mutual savings and finance companies. Section 4 describes the data we use, documents the variables employed in the regression and gives an overview of the degree of distress in our sample. Section 5 assesses the contribution of various factors in explaining financial distress in a regression model, while section 6 concludes.

2 Motivation and review of the empirical literature

Our work relates to the literature on predicting individual financial institutions' distress and closures. Early Warning Systems trying to predict the failure of individual financial institution were developed since the '70s.[1] Mainly applied to developed countries' banking systems, these systems have proven important tools for supervisory agencies to devise efficient schedules for individual on-site bank examinations and initiate remedial actions, while minimizing the use of relatively scarce examination resources. Early Warning Systems share a similar approach. On the basis of a set of financial ratios, reflecting the different dimensions of a CAMEL rating system,[2] the statistically best subset of variables is chosen to distinguish between potentially financially-troubled and sound financial institutions, within a certain prediction horizon.[3]

Our work also draws upon a separate—though related—strand of literature focusing on what exactly triggers the decision to close a distressed bank. Kane (1988) casts such decisions within the framework of public choice theory. Regulatory authorities may or may not choose to exercise the closure decision—even when the bank is economically insolvent—depending on, among the other, the importance of the specific financial institution to the economy and its

[1] See, among the others, Meyer and Pifer (1970); Sinkey (1975); Altman (1977); Martin (1977); Pettaway and Sinkey (1980). See Altman (1981) for a comprehensive survey of the early wave of this literature.
[2] CAMEL stands for the crucial bank indicators: Capital adequacy, Asset and Management quality, Earnings, Liquidity.

potential systemic impact. In order to avoid closure, government support may be granted either directly—e.g. through recapitalization—or indirectly—e.g. the regulatory authorities may arrange an assisted merger, or regulatory forbearance, or accounting or tax preferences may be accorded. Regulatory capture and political considerations may also play a role at this juncture. According to this approach, it is likely that "Too Big To Fail" policies attain—i.e. irrespectively of their distress status, larger-sized institutions are more probably salvaged.

We take our start from here. Furthermore, the commonly held tenet that smaller-sized financial institutions are more likely to fail does not derive from the Too-Big-To-Fail Doctrine only, but also from the Credit Channel approach. One can argue that small banks find it harder—if not impossible—to compensate a deposit drain by promptly collecting funds in the wholesale financial market. For instance, Kashyap and Stein (1994, 1997) provide evidence that monetary restrictions hurt small banks more than large ones. In addition, when a systemic financial crisis ensues, depositors may enact a *flight to quality (safety)* towards larger banks—perceived to be less likely to go bankrupt as they will more probably be bailed out by the Government, according to the "Too Big To Fail" policy—and away from small banks. Accordingly, in a systemic crisis, smaller-sized financial institutions are more likely to experience liquidity problems and to be unable to solve such problems either in the market or with the help of the authorities.

Using this background and referring also to a rich empirical literature on financial institutions' distress,[4] Bongini, Claessens and Ferri (1999) analyze financial institutions' distress and closure in connection with the East Asian crisis—i.e. in Indonesia, Korea, Malaysia, the Philippines and Thailand. Specifically, using 1996 financial data, they reach the following results that will be relevant here: (i) Traditional, CAMEL-type variables—loan loss reserves to capital, loan growth, net interest income to total income, return on assets, and loans to borrowings—help predict subsequent distress and closure; (ii) larger institutions were more likely distressed, but less likely closed, suggesting a "Too Big To Fail" policy.

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[3] As their goal is early warning, these models aim to predict the economic insolvency of a bank rather than the narrow notion of *de jure* failure.

[4] See, among the others, Lane, Looney and Wansley (1986), Whalen (1991), Cole and Gunther (1995), Gonzales-Hermosillo (1998).

While this evidence of a "Too Big To Fail" policy is suggestive, it is desirable to further test it. In fact, Bongini, Claessens and Ferri (1999) derived their results within a sample of banks for which balance sheet/profit and loss accounts data were available in the BANKSTAT database. Since this database includes only medium-large financial intermediaries, the derived sample may not be fully adequate to test the hypothesis that smaller-sized banks were more likely to become distressed.

In order to overcome this potential problem, we decided to complement the referred analysis by extending the sample to include a large number of smaller-sized financial institutions. Specifically, we gathered balance sheet/profit and loss accounts information for all the tiny-sized Korean mutual savings and finance companies (MSFCs) and added these intermediaries to the group of Korean financial institutions already represented in the BANKSTAT database. Thus, our present analysis will be in the position to properly assess whether smaller-sized intermediaries were more prone to distress in the systemic crisis, although—due to data availability—we can accomplish this only at the cost of restricting our investigation to the case of the sole Korean intermediaries.

MSFCs, however, differ from the other BANKSTAT Korean intermediaries not only in their size but also in their mutual status and in the fact that their banking charter is, by and large, restricted to a single locality. This makes it imperative that—before venturing into the empirical analysis—we outline some of the specific traits of mutual/cooperative banks according to the literature and offer a brief description of what type of intermediaries MSFCs are in the Korean reality.

A strand of literature has analyzed the special relationships at local and/or cooperative banks that may make credit allocation at these banks more efficient than at non-local/non-cooperative banks. In particular, it is held that the local nature and/or the cooperative ownership structure of these community banks can give them a comparative advantage in dealing with asymmetric information and agency problems.

In essence, this literature proposes two points of view. On the one hand, authors proposing the "long-term interaction hypothesis" (Banerjee, Besley and Guinnane, 1994; Besley and Coate, 1995) suggest that agents who take part in the life of the community share relationships of various kinds, not only economic, through which they acquire information that

would be available to an outsider only at a cost. A bank operating in a small community, owned and/or managed by community members, may take advantage of this information in its lending activity. An additional advantage could stem from the possibility of applying "social sanctions", which are generally not available to ordinary non-local commercial banks. On the other hand, authors proposing the "peer monitoring hypothesis" take a different view. According to them, a different effect is at work when the benefit for each member of a given group depends in some well-defined way (e.g. a contract) on the behavior of all the others. In the case analyzed by Stiglitz (1990), Varian (1990), and Hoff and Stiglitz (1990), each member may continue to benefit from her loan only if all the others' projects are successful, so members have an incentive to control each other.[5]

All in all, the "peer monitoring" elicited by their mutual nature and deep local roots might help explain the systematically smaller probability of distress within the MSFC group.

3 The Korean Mutual Savings and Finance Companies

Mutual Savings and Finance Companies (MSFCs) were established in Korea in 1972 in an effort to inducing small savers' financial assets which were then a major component of the local community-rooted and privately-operated curb market into better institutionalized and organized financial market. In those days' Korea, nearly all financial institutions, mostly commercial banks, were used as a main vehicle channeling limited development finance for a few selected export-oriented industries with the aim of a rapid economic development. Accordingly, petty households and trifling small-scale businesses often financed themselves through the private finance associations and companies, such as a mutual savings and finance association (namely mutual "Kye" association),[6] or a mutual finance company (namely "Moojin" company). However, prior to the 1972 regulatory overhaul, the ineffectiveness of regulation and supervision made these intermediaries particularly fragile and prone to opportunistic behavior,

[5] Analyzing the availability and cost of credit for a sample of Italian small businesses, Angelini, Di Salvo and Ferri (1998) find that member customers of credit cooperative banks enjoy better lending terms than similar firms borrowing at non-cooperative banks. They also conclude that the main distinctive features of credit cooperative banks relative to commercial banks stem from their cooperative ownership rather than their local nature.

[6] The term mutual savings and finance business means a receipt of fraternity dues and a payment of money to pay, which is conducted in accordance with an agreement that it pays money to fraternity members by the method of drawing, bidding, etc. to each account after making it deposit a regular dues and by specifying a certain number of accounts, period, and amount. (*Mutual Savings and Finance Companies Act*, 2(1)).

bringing about numerous failures, and substantial damages to depositors. The case of the mutual credit "kye" was a typical example to understand the incentive mechanism in these private finance companies.

The mutual credit "kye" was a traditional community-based savings and loans association with a fixed number of members and an order of cash receipt set by lottery. The "kye" intermediation process could be summarized by the following two aspects: i) a "kye" leader collected an installment payment from each fraternity member on a monthly or daily basis; and ii) having paid at least the first installment payment, a "kye" fraternity member was eligible to receive the whole contract amount of cash if she was selected by drawing or bidding. However, without adequate restrictions to reduce moral hazard problems, this mechanism could not make the incentive of a "kye" leader (the lender/the borrower) compatible with that of a "kye" fraternity member (the borrower/the depositor). In the situation of aspect i), theoretically, each "kye" member would need to exercise a close monitoring of the "kye" leader's behavior to resolve the moral hazard possibly driven by the 'kye' leader. Whereas the "free-riding" opportunities which other fraternity members take advantage of the information that another member has paid for discouraged an ordinary "kye" member from monitoring a leader activity. Thus the probability of distress increased. Furthermore, as for the aspect ii), since a traditional form of mutual "kye" cannot activate such an incentive structure as the "peer monitoring" documented by Stiglitz (1990),[7] it was also too hard to alleviate a moral hazard arising from the default risk incurred by a "kye" member (borrower). The most frequently reported accidents were the disruption of the "kye" due to the embezzlement by a leader, who played the role of *de facto* financial institution among members (depositors). Consequently, this raised the need for a regulatory infrastructure to lessen the moral hazard prevailing in private finance associations and companies in the local communities.

At this juncture, the promulgation of the MSFC Act of 1972, which legally swapped private finance associations and companies with officially supervised MSFCs, played a crucial

[7] There is a difference between "kye" finance and the loans by the Grameen Bank. A "kye" member could receive her portion of cash by drawing or bidding method regardless of the repayment of other member who borrowed before her. On the contrary, self-formed groups of borrowers receiving loans from the Grameen Bank are mutually responsible for repaying the loans and other members of the group cannot obtain credit until existing loans are repaid (Stiglitz, 1990).

role of blocking up a moral hazard with the introduction of stricter regulatory mandate. In particular, among the various regulations, the following two articles of the *Act* ([37-2: Preferential Payment Right for Depositors][8] and [37-3: Joint Liabilities of Officers][9]) are clear examples of stricter regulations that were imposed on MSFCs than those for banks.

Furthermore, MSFCs were aimed at specializing in the finance for households and small scale businesses without sufficient collateral and under low financial credibility. Even though—since April 1983—MSFCs were allowed to open branch offices with the approval of the Minister of the Finance, their business area is still restricted within the province where they are located.[10] As of the end of June 1998, the number of MSFCs stood at 230 and they had a total of 104 branch offices.

The main business of MSFCs consists of the acceptance of *credit mutual installment savings, mutual time deposits*, and *mutual time deposits with compound interest rates*. Credit Mutual Installment Savings entitle the depositor (fraternity member) to borrow a certain amount of money after paying more than one-third of the total installment savings contract. The contract period is less than five years with daily or monthly installment payment by the fraternity member. Mutual time deposits—with or without compound interest rates, introduced in 1987 and 1991 respectively and similar to time deposits of commercial banks—have shown a steady expansion.

The most unique and distinctive businesses distinguishing MFSCs from other financial institutions are mutual "kye" and credit mutual installment savings. According to the Article 6 of the Mutual Savings and Finance Company Act, an MSFC has a legal authorization for an exclusive business in the area of a mutual "kye" and credit mutual installment savings.[11] The mutual "kye" originally constituted an important aspect of MSFCs' business but has shown a

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[8] Except when there is a special regulation or other law, depositors hold the most senior claims on the MSFC. In practice, in the event of MSFC bankruptcy, the repayment of depositors' claims will precede that of other claims.

[9] Officers and main stockholders shall be liable to jointly compensate liabilities related to depositors of the MSFC. Retired officers shall be responsible until three years after retirement for such liabilities related to deposits of MSFC arising before their retirement.

[10] Article 4 of the "Standardized Procedure of Business of Mutual Savings and Finance Companies" describes the regulation about a business boundary enforced on each MSFC.

[11] "A person who intends to engage in the business mentioned in §11(1)/1 (Mutual "kye") and §11(1)/2 (Credit mutual installment savings) shall obtain an authorization of an MSFC from the Ministry of Finance and Economy except for the cases specifically prescribed in other statutes".

sharp decline and now accounts for a very small fraction of their business. The main reason for this notable contraction could be found in the fact that the procedures involved in grouping "kye" were complicated and troublesome so that a standardization was hard to achieve.[12]

All in all, MSFCs with larger shares of deposits in the form of credit mutual installment savings are the ones which kept closer to their original business. Although MSCFs are not exactly the same as cooperative communal associations—like Credit Unions and Community Credit Cooperatives—they are similar to communal cooperatives in the following sense: i) the business boundary is restricted within a small community; ii) a compulsory minimum lending requirement of more than 50% of total loans must be maintained for SMEs and households within its business boundary.[13]; iii) more than 80 per cent of MSFCs are owned by community members[14]; iv) and MSFCs have a structure of higher deposit-taking/lending shares which are analogous to those of Credit Unions and Community Credit Cooperatives.[15] A credit mutual installment savings could be the most proper candidate capturing a "cooperative communal" trait that MSFCs have in them on that score.

Although MSFCs have both different assets and liabilities mix from that of other banks[16], MSFCs and other banks could still be comparable for the following reasons: i) both of them are issuing 'similar' deposits[17] and lending to 'similar' borrowers. For instance, Table D exhibits that Mutual Time Deposits with compound interest rates, which are introduced for improving competitiveness of MSFCs over commercial banks, composed of more that 55 per cent of the

[12] Under the current regulation, the following six types of fixed number of members need to be constructed: 32-person; 26-person; 18-person; 13-person; 12-person; and 10-person group.
[13] In 1994, the minimum requirement ratio was 80% of total loans.
[14] See Table V: Ownership Structure of MSFCs.
[15] Share of deposits and loans over total assets or total liabilities and net worth (as of end of 1997)

	Deposits	Loans and Discounts
▪ MSFCs	75.6	78.0
▪ Credit Unions	76.7	65.6
▪ Community Credit Cooperatives	74.6	55.0
▪ Nation-wide Commercial banks	55.3	32.9
▪ Local banks	49.1	36.8
▪ Merchant Banking Corporations	44.1	30.6

[16] Table C: Comparison of Assets and Liabilities Mix for Different Types of Banks.
[17] Table D: Deposits by Type of MSFCs and Banks (as of 1997).

total deposits of MSFCs. Whereas mutual installment deposits issued by banks[18] shares 14.3 per cent of total banks deposits. Moreover, both of them are subject to the same regulation of minimum lending requirement to the SMEs mostly having business in the local provinces.[19] ; ii) and both of them are competing in the same local market as reported in Table E.[20]

4 The sample and variables

4.1 Sample selection

We investigate distress for 51 larger-sized financial institutions and 226 Mutual Savings and Finance Companies (MSFCs) from Korea over the year immediately prior to the crisis, 1996. Specifically, the breakdown of the data by type of institution is as follows: 28 commercial banks, 23 Merchant Banking Corporations and 226 MSFCs (Table I). Coverage of the national financial sector in terms of total assets is high and it is substantial in terms of number of institutions. For commercial banks and MSFCs the coverage is 100 per cent, both in terms of number of number of institutions and in terms of total assets. For merchant banks, the coverage by our sample is 77 per cent in terms of number of institutions and about 80% per cent in terms of total assets.

We consider distress during the two years following the onset of the Korean financial crisis, i.e., from November 1997 up to September 1999. Following Bongini, Claessens and Ferri (1999), we define distress as all those instances in which a financial institution has received external support as well as when those instances in which it was directly closed. Distress is identified as one of the following: i) the bank was closed; ii) the bank was merged with another bank;[21] iii) the bank was recapitalized by either the Central Bank, the Deposit Insurance Corporation; iv) the banks' operations were temporarily suspended or transferred to Hanareum

[18] Mutual installment deposits issued by banks differs from credit mutual installment savings of MSFC in its method of reimbursement of principals and interests. The original contract of mutual installment deposits of a bank comes to an end when an eligible depositor, who already has paid more than 1/3 of contractual amount of her dues, receives loans. And principles and interests of this loan should be redeemed evenly throughout the remaining maturity. Whereas, in case of MSFC, principles and interests of a loan should be redeemed evenly throughout the original contract period.

[19] A minimum lending requirement ratio is 45 per cent for nation-wide commercial banks, 50 per cent for MSFCs, and 60 per cent for local banks.

[20] Table E: Number of financial institutions (head office+branches) by province.

[21] Banks merged under distressed conditions are treated as failed and added to the failed group.

Merchant Banking Corporation—i.e. the bridge bank specifically created on December 1997 to tackle the crisis of 14 failing merchant banks. To identify distressed financial institutions we rely on publicly-available sources, including Central Bank's web sites and newspapers articles.

Table II provides the frequency distribution of our sample with respect to distress. The groups of distressed vs. non-distressed intermediaries are constructed by random sampling, including all institutions for which complete data were available. More than 24 per cent of the institutions in our sample experienced distress over the period November 1997- September 1999. Of the whole sample of distressed intermediaries, 54 per cent are MSFCs and 46 per cent are commercial banks and merchant banks. Considering each category of intermediary, the distress ratio is 16 per cent for MSFCs while it is substantially larger for commercial banks (64 per cent) and for non-bank financial institutions (57 per cent).

4.2 Variable selection

We gathered financial statements for these 277 intermediaries from two different sources: specifically, BANKSTAT[22] for the sample of larger-sized intermediaries, and Korea's Financial Supervisory Services (FSS) for the MSFC group.

We use financial information for the fiscal year preceding the crisis, thus avoiding any risk of contaminating estimations with the occurrence of distress itself.[23] We collect financial data for the different dimensions of a CAMEL-type risk analysis, as used by supervisors in many countries. Major difficulties are faced when looking for variables proxying for the risk dimension of the intermediary's activity, such as the ratio of non performing loans to total loans or the risk-adjusted level of capitalization. Notwithstanding this problem, we end up with using twelve variables as potential predictors of distress with respect of the whole sample and thirteen variables when restricting our analysis to the MSFC sample.[24] These variables, their corresponding CAMEL-categories and their definition are listed in Table III. Variables such as these have appeared in previous studies and have been identified as good predictors of distress (for excellent reviews of this literature, see Altman, 1981 and Demirguc-Kunt, 1989).

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[22] BANKSTAT is a comprehensive database of balance sheet and income statement data for individual financial institutions across the world.

[23] For those institutions whose fiscal year closes at year end, we used end-1996 data; for those institutions whose fiscal year is either March or June, we used March or June 1997 figures.

In addition to the traditional Camel variables, we include several variables to account for other important dimensions of bank activity, such as size and ownership structure. Although not strictly a CAMEL variable, size has usually been added in early warning studies as a proxy for "too big to fail" situations or for "credit channel" hypothesis. Ownership structure is deemed to have a direct and important impact on managerial efficiency and on bank financial risk. State-owned institutions might be less efficient than private financial institutions, take more risks due to their suffering from political motivated lending. Similarly, among privately-owned intermediaries, extensive relationships among financial intermediaries and corporations or influential families could add to financial risk. This can be because the company or the family might be tempted to influence, for its own purposes, the intermediary's loan policy.

We use various sources to obtain information on financial institutions' ownership structure, namely FSS (Financial Supervisory Services) information for MSFCs and the BANKSTAT, BANKSCOPE databases and Claessens, Djankov and Lang (1999) for the other intermediaries. We consider two different ownership forms: state-owned and private-owned; among the latter we also distinguish among family-owned, company-owned, financial-institution-owned and widely-held intermediaries. A financial intermediary is defined as state-owned if at least 50 per cent of the equity is held by the government or a state-owned institution: in our sample, only a few institutions—all of them commercial banks—are state-owned[25]. Among the privately-held institutions we are able to discriminate between widely-held institutions and institutions belonging to either a family or an industrial or financial conglomerate. Following Claessens et al. (1999), we define an intermediary as "connected" when the largest owner has a stake of more than 20 per cent and it is either a family or an industrial conglomerate. For the MSFC group we also considered the possibility of belonging to a financial conglomerate. Table IV shows the distribution of our sample with respect to ownership structure and connections with industrial/financial groups or influential families. Table V does the same for the sample of MSFCs.

[24] For MSFC, more information was made available to us by the FSS.
[25] Only five out of 277 samples are state-owned banks (Table IV).

5 The Empirical Analysis

5.1 Methodology

We use a qualitative response model to estimate the probability of the occurrence of distress among Korean intermediaries as a function of a vector of independent variables, X, and a vector of unknown parameters, θ. The specific model we use is:

$$\Pr(Y_i = 1) = F[H(X_i, \theta)] = \frac{1}{1 + e^{-H_i}}$$

where:

Yi is the dependent variable which takes the value of one if the financial institution has experienced distress and zero otherwise;

F is the probability function which has a logistic functional form, giving rise to the logit model;

$$H_i = \theta_0 + \sum_{j=1}^{M} \theta_j x_{ij}$$

where:

X_i is the vector of independent variables for the i-th individual financial institution; and

θ is the vector of unknown parameters to be estimated.

We estimate two models. In both models the dependent variable takes the value of one if the intermediary has experienced distress during the period November 1997-September 1999 and zero otherwise. Model one and model two differ on sample composition and choice of independent variables.

The first model is estimated on a sample of 277 observations, including all three categories of intermediaries under study: commercial banks, merchant banking corporations and MSFCs. Our purpose here is twofold. On the one hand, we want to highlight which financial characteristics were common to all distressed institutions, irrespective to their business specialization. On the other hand, we also test the Too Big To Fail and Credit Channel hypotheses that suggest that the probability of distress be larger for the small-sized

intermediaries. Independent variables used are those commonly employed in failure-prediction models, i.e. CAMEL variables, plus some variables proxying for ownership structure.

The second model is estimated on a sample of 226 observations, comprising only MSFCs. As the probability of distress among Korean intermediaries is significantly smaller, not larger, for small-sized institutions, we further investigate the specific characteristics of the survived MSFCs that helped them weather the crisis. As such, along with the CAMEL variables that proved to be good predictors of the probability of distress in the first model, we also add specific variables proxying for the peculiarities of the business of these banks.

5.2 The rationale of the explanatory variables

Table VI summarizes each variables' rationale, along with the expected sign of its impact on the probability of bank distress and closure.

Among the CAMEL-type variables, higher capitalization is expected to have a negative impact on the probability of distress, as the financial intermediary will be better able to absorb losses. A larger share of capitalization due to loan loss reserves could give two different signals. On the one hand, it could be associated with more risky assets: in this case, it should increase the probability of distress. On the other hand, a larger reliance on loan loss reserves could highlight a more conservative and prudent behavior on the part of the management with regard to provisioning policies: in this case, it should reduce the probability of distress. Similar considerations apply to the ratio of provisions to total loans. Higher loan growth and a higher ratio of loans to total assets are expected to increase the likelihood of distress, as they entail more risk exposure. The ratio of operating expenses to total revenue—proxy for the inefficiency of management—should have a positive impact on distress. Regarding the earnings variables, higher ROA or higher ROE are expected to decrease the probability of distress. Finally, a less liquid bank is expected to more likely suffer from a run and become distressed.

Among the non-CAMEL-type explanatory variables we consider size and several variables related to the ownership structure. In terms of the probability of distress, a larger bank might have a lower chance of becoming distressed if it is more diversified and less exposed to liquidity shocks. In addition, one would expect that authorities may consider large intermediaries "too big to fail" and be more prone to rescue them. Finally, larger financial

intermediaries—as argued by the Credit Channel approach—might be better able to compensate the deposit drain in the systemic crisis.

Our ownership variables refer to both management and corporate governance quality. Consequently, their relationship with distress is not always obvious. State owned banks might be less efficient than private banks, take more risks and suffer more from political motivated lending, thus increasing the probability of facing distress. At the same time, state-banks may benefit from depositors' flight to safety—domestic deposits shifting from non-state-owned to state-owned banks—and may have had easier access to financing during the crisis as they were perceived more likely to receive support in case of trouble (Ding, Domaç and Ferri 1999). Distress may thus have been easier to overcome in the case of state-banks. Finally, "connected" intermediaries should be more prone to distress, because of the likely higher degree of misallocation.

Among the variables specifically related to the MSFC peculiarities, the ratio of *credit mutual installment savings to total deposits* represents the best proxy identifying that they kept closer to their business origins. In fact, after their 1972 regulation, this type of activity was for MSFCs the admissible one closest to their traditional "kye" business. The dummy variable "connect" is disentangled in its four different specifications—chaebol-owned; financial institution-owned; family owned and widely-owned—to gain better insight in the potential effect on MSFC business deriving from different forms of ownership. Since data regarding the group of MSFCs was obtained from their supervisory authority, a larger amount of information was available which made it possible to enlarge the number of potential explanatory variables. Table VI reports only those variables that proved significant in our subsequent multivariate analysis.

Table VII reports summary statistics for the explanatory variables over the year immediately prior to the crisis. It presents data for the whole sample of financial institutions (column 2) and various breakdowns (columns 3-10) by different classifications for our intermediaries and conducts z-statistics for these pair-wise split of the data. Reading down columns at median values for the various dichotomous partitions of the sample some preliminary conclusions emerge.

Distressed institutions have lower capitalization in terms of total assets than non-distressed institutions; this result does not hold true if capitalization is measured in terms of total

loans, which in turn highlights both a higher degree of business diversification among distressed institutions, whose portfolio of loans, in fact, accounts for a smaller share of both total assets and total borrowings, and a larger size with respect to non-distressed intermediaries. In addition, distressed institutions have a higher inefficiency ratio and lower profitability—both in terms of ROE and ROA. In contrast to our hypothesis, this bi-partition of the sample does not show any statistically significant difference with respect to connections. Finally, MSFCs account for a large share of distressed institutions (54 per cent). However, as already mentioned, this result does not imply that the phenomenon of distress has particularly affected this category of banks. On the contrary, distress is more pronounced among commercial and merchant banks (92 per cent) than among MSFCs (61 per cent).

Commercial and merchant banks are grouped within the definition of "larger-sized institutions" given their larger dimension when compared to the tiny size of MSFCs. Not surprisingly, some of the features distinguishing among distressed and non-distressed institutions carry over to those distinguishing larger-sized intermediaries from MSFCs. The former, in fact, has statistically significant lower capitalization in terms of total assets, higher asset diversification, higher inefficiency ratios and lower profitability. Connections tend to be a more pronounced phenomenon among larger-sized intermediaries than among MSFCs.

The last dichotomous partition that we consider with respect to the whole sample refers to "connections". Connected intermediaries are better capitalized in terms of total assets, their portfolio of loans takes up a larger share of their assets while their provisioning policy tends to be rather less conservative with respect to non-connected intermediaries, which tend to be smaller institutions. With respect to efficiency and profitability, no clear statistically significant difference holds for the two groups.

Next we perform a similar analysis for the sample of MSFCs (Table VIII). Here, it is worth noticing that, along with being less capitalized, less profitable and more inefficient, distressed MSFCs also tend to collect a smaller share of their deposits in the form of “credit mutual installment savings” and are younger. Besides, a larger share of them is owned by financial institutions; indeed this is not surprising at all: the fact that the group of commercial and merchant banks were those intermediaries mostly hit by the crisis must have had an immediate impact on their shareholdings' fate.

These results do not control however for the relationship among the various variables for which we now turn to our qualitative response models.

5.3 Fitting the logit models

In order to select those variables that result in our preferred specification with respect to both statistical significance and economic meaning, we took the following steps (see Hosmer and Lemeshow, 1989).[26] First, the selection process starts with a careful univariate analysis of each variable, which involves fitting a univariate logit regression model to obtain the estimated coefficients, the estimated standard error and the likelihood ratio test for the significance of the coefficient. Second, upon completion of the univariate analysis, we select those variables whose univariate tests hold a p-value less than 0.25[27] as good candidates for the multivariate analysis along with all variables of known economic importance within the model. The fit of the *full model* includes: "equity/loans and (equity + loan loss reserves)/total assets" for the Capital dimension; the share of loan loss reserve over total capitalization, loan growth and the ratio of loans to total assets for the Asset quality dimension; ROA for the Earnings dimension; "loans/borrowings, liquid assets/total assets, and securities/total assets" for the liquidity position ratios; Size and the dummies for MSFC, Connect and CORGOV. Third, we eliminated those variables that do not contribute to the estimated model and fit the new model. The likelihood ratio test confirm that the new model (Table IX) represents our best specification, i.e. the one that holds only the essential and both economically and statistically relevant variables.

Table IX comprises a summary of the estimation results. For each variable in the model, we present the estimate of the coefficient, the probability level of the test that the population coefficient is equal to zero (in brackets), and the pseudo R-square, which is a measure of the goodness of fit of the overall model. A positive (negative) coefficient in the logit model indicates that an increase in the variable is associated with an increase (decrease) in the probability of distress.

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[26] We discarded the idea of using mechanical selection procedures, such as a stepwise procedure combining forward and backward variable elimination based solely on statistical criteria, in order to avoid ending up with a statically significant yet economically implausible model.

[27] This selection criteria follows the work of Mickey and Greenland (1989) on logistic regression, where it is shown that use of a more traditional level (such as 0.05) often fails to identify variables important to the analysis. Besides, variables that might appear, under a univariate test, weakly associated with the dependent variable, might indeed become important predictors of the outcome when taken together. See also Hosmer and Lemeshow (1989).

The signs are all as anticipated expect for those of loan growth and MSFC. The negative sign of loan growth is indeed difficult to justify. Perhaps, a reasonable explanation might be that, even prior to the crisis, loans were increasing more for sounder institutions and—possibly as a result of supervisory action—were increasing less at the others.

The unexpected negative sign for the dummy MSFC goes hand in hand with the unexpected positive sign for the variable SIZE. The latter is statistically significant only when the dummy MSFC is discarded from the model; indeed the two variables are highly correlated with each other in our sample (-0.85). In other word, they may capture the same phenomenon, i.e. larger size is neither a guarantee for diversification (and its beneficial effects in terms of risk reduction) nor conveys a special status (TBTF), e.g. insulated from the possibility of failing. However, we cannot altogether discard the possibility that the MSFC dummy might lead to three further interpretations, which do not contrast with the above explanation.

First, it could be that—given their typical intermediation—MSFCs presumably had a negligible exchange rate exposure: since the sharp devaluation of the Korean won was perhaps the major shock to Korean financial intermediaries, MSFCs were arguably insulated from it.[28]

The second, one might argue that MSFCs lent little to large firms which were most hit by the shock during the Korean financial crisis. So the less distress of MSFCs should not be surprising. In this context, Domaç, Ferri and Kang (1999) report the convincing evidence of disproportionate damages burdened on SMEs during the credit crunch period in the form of a stricter contraction in bank loans, a sharp drop in their production activities; and increasing number of bankruptcies compared with large corporations.[29]

The third alternative further interpretation hinges on the fact that—as explained in sections 2 and 3—MSFCs differ from other Korean financial institutions not only in their size, but also in their mutual status and deep local roots. This, in turn, might explain their being more insulated from the systemic crisis than expected.[30]

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[28] Unfortunately, due to unavailability of data to quantify the exchange risk exposure, it was impossible to test this hypothesis.

[29] See Table F (Loans of Deposit Money Banks by Size of Firms), Table G (Corporate Bankruptcies by Type) and Figure A (Change in Industrial Production (year-on-year).

[30] Therefore, we considered including an interaction term among the two variables—size and the dummy MSFCs. In this way, we hoped to be able to disentangle the effect of size and that of being a mutual saving and finance company, but no statistically significant result derived.

Many literature already pointed out that large banks tend to keep long-run contractual relations with large corporations, and small banks keep long-run contractual relations with small non-financial companies.[31] This implies the fact that the most risky and smallest SMEs could only gain their access to the loans though MSFCs which are even smaller intermediaries than local banks in their size. Therefore, the negative sign for the MSFC dummy is all the more illustrating a significance of the 'peer monitoring' brought forth by its mutual nature and deep local roots given its still higher lending shares than those of nation-wide, local banks and merchant banking corporations[32].

Taken as a whole, the results in Table IX indicate that all coefficients are highly significant. Besides, the model shows a good predictive power: almost 84 per cent of financial institutions were correctly classified.

In sum, a better capitalized and profitable financial institution is less likely to encounter distress; controlling for other factors, being a mutual saving and finance company reduces the probability of distress, while connections of a financial institution with industrial groups or influential families increase it.

We now turn to the second step of the analysis, in which we draw our attention only on the sample of Mutual Savings and Finance Companies. We estimate a model which considers, as independent variables, those CAMEL ratios that proved good predictors of the probability of distress for the overall sample and adds specific proxies for the peculiarities of the business of MSFCs. Table X includes a summary of the estimation results; all coefficients are highly significant and the model shows a predictive power of almost 86 per cent.

Better capitalization, higher loan growth and a higher liquidity position reduce the probability of distress, while "connections" increase it. However, this is true only with respect to connections with financial institutions or influential families; indeed none of the *chaebol*-owned MSFCs did experience distress. Profitability does not appear a relevant factor in explaining the fate of an MSFC and is discarded from the model.

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[31] These long-run contractual relations can be simply explained by the need for the banks to diversify their portfolio: since large non-financial firms tend to undertake large loans, for a small bank a long-run relation with a big company would imply a loss of diversification (Angeloni *et al*., 1995).

[32] According to Table C, the 3-year average ratio of lending over total assets for MSFCs is 74.9 per cent and 33.7 per cent for the other banks.

Most interestingly, the regression brings support to our second hypothesis that the resilience of MSFCs to the systemic crisis could stem from their better allocation of loans thanks to the "peer monitoring" elicited by their mutual nature and deep local roots. Specifically, controlling for other factors, an MSFC collecting a larger share of its deposits in the form of "credit mutual installment savings"—the variable we identified to proxy for how close MSFCs kept to their original business in their local community—is less likely distressed. Similar outcomes apply when considering those MSFCs with longer business history in their local communities: deep local roots may also be a signal for being closer to their business origins, thus helping the MSFC to better weather the systemic crisis.

6 Conclusions

Both the Too-Big-To-Fail Doctrine and the Credit Channel approach hold the tenet that the probability of distress be larger for the small-sized intermediaries. In this paper we have taken the Korean experience as a laboratory experiment of a systemic financial crisis to test for this tenet. Specifically, we have analyzed individual distress for a sample of financial intermediaries pooling together a group of larger-sized financial institutions and a group comprising all the tiny-sized mutual savings and finance companies (MSFCs).

Contrary to the commonly held tenet, we found that the percentage of distressed institutions was smaller among the MSFCs than in the group of larger-sized intermediaries.

We argued that this unexpected result might stem from two alternative hypotheses. First, it might derive from the fact that exchange rate exposure—a major shock to Korean intermediaries—was presumably negligible for MSFCs. Second, the result might originate from a better allocation of loans for MSFCs thanks to the "peer monitoring" elicited by their mutual nature and deep local roots. While available data did not allow us to test the former hypothesis, we found support for the latter. Specifically, estimating a logit model, we showed that the probability of distress was systematically smaller for those MSFCs that kept closer to their origins—e.g. collecting a larger share of deposits in the form of "credit mutual installment savings"—and for those with longer business history in their local communities.

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Table A: Lending Market Share (%)

End of	Nation-wide Commercial Banks	Local Banks	Merchant Banking Corporations	MSFCs	Total
1993	52.54	12.72	15.54	19.20	100%
1994	51.58	12.26	16.67	19.49	100%
1995	55.42	11.92	14.72	17.94	100%
1996	57.46	12.12	13.01	17.41	100%
1997	62.89	10.89	12.01	14.21	100%
1998	71.92	8.56	7.27	12.25	100%
1999. 6	75.94	8.50	5.03	10.53	100%

Source: Monthly Bulletin, The Bank of Korea

Table B: Deposit Market Share (%)

End of	Nation-wide Commercial Banks	Local Banks	Merchant Banking Corporations	MSFCs	Total
1993	55.59	15.96	8.57	19.89	100%
1994	52.48	13.91	14.77	18.84	100%
1995	59.08	12.28	12.00	16.64	100%
1996	60.72	12.10	11.28	15.90	100%
1997	63.17	9.37	15.31	12.15	100%
1998	69.36	8.57	12.24	9.83	100%
1999. 6	73.63	9.35	7.81	9.21	100%

Source: Monthly Bulletin, The Bank of Korea

Table C: Comparison of Assets and Liabilities Mix for Different Types of Banks

ASSETS		**1996**	**1997**	**1998**
▪ Cash & Due from banks	1) Nation-wide	10.04	8.3	6.3
	2) Local	12.3	14.2	6.6
	3) Merchant Banks	5.6	4.6	4.8
	4) MSFCs	10.4	10.5	11.9
▪ Securities	1) Nation-wide	12.4	13.1	24.1
	2) Local	16.6	18.4	26.4
	3) Merchant Banks	16.5	16.0	31.5
	4) MSFCs	3.3	2.9	6.9
▪ Loans & Discounts	1) Nation-wide	35.2	32.9	32.7
	2) Local	37.0	36.8	36.1
	3) Merchant Banks	40.0	30.6	22.2
	4) MSFCs	77.5	78.0	69.2
▪ Fixed Assets	1) Nation-wide	3.9	3.7	4.2
	2) Local	4.1	4.8	6.0
	3) Merchant Banks	1.2	0.1	1.2
	4) MSFCs	5.2	5.8	8.6
▪ Foreign Assets	1) Nation-wide	8.6	12.3	8.9
	2) Local	3.6	4.1	2.5
	3) Merchant Banks	-	-	-
	4) MSFCs	-	-	-
LIABILITIES and CAPITAL		**1996**	**1997**	**1998**
▪ Deposits	1) Nation-wide	53.7	55.3	56.5
	2) Local	54.7	49.6	62.7
	3) Merchant Banks	38.6	44.1	54.6
	4) MSFCs	78.9	75.6	81.0
▪ Capital	1) Nation-wide	6.2	3.9	3.8
	2) Local	6.8	5.2	2.8
	3) Merchant Banks	7.6	5.3	6.3
	4) MSFCs	13.2	12.1	13.4
▪ Foreign Liabilities	1) Nation-wide	7.7	5.0	5.0
	2) Local	1.8	2.0	0.1
	3) Merchant Banks	-	-	-
	4) MSFCs	-	-	-

Source: Monthly Bulletin, The Bank of Korea

Table D: Deposits by Type of MSFCs and Banks (as of 1997)

(billion won, %)

Deposits Money Banks* (as of end of 1997)			**MSFCs (as of June 1997)**		
	Amount	Ratio		Amount	Ratio
Passbook	10,127	5.8	Passbook	1,080	3.6
Time Deposits	47,387	27.4	Time Deposits	7,276	24.5
Installment savings	17,173	9.9	Installment savings	36	0.1
Mutual Installments	24,794	14.3	Credit Mutual Installment	2,714	9.1
Housing Installment	6,186	3.6	Time with compound interest	16,576	55.8
Savings	45,721	26.4		995	3.3
Other**	21,592	12.6	Cover Bills***	1,029	3.6
			Others		
Total	172,980	100.0	Total	29,706	100.0

Source: Monthly Bulletin, The Bank of Korea

* Deposits Money Banks include nation-wide commercial, local and specialized banks.

** The rest of Demand Deposits except Passbook account such as Checking, Temporary, Public, and Credit control account plus Worker's property formation and Company savings.

*** Cover bills are issued on the basis of underlying primary commercial bills discounted and held by MSFCs. The denomination or maturity can be tailored to the investor's need and may differ from that of the underlying bills.

Table E: Number of Financial Institutions (head office+branches) by Province

Province	MSFCs (as of September 1999)	Nation-wide Commercial banks (as of end of 1998)	Local banks* (as of end of 1997)
▪ Seoul	74	1,943	-
▪ Pusan	33	284	195
▪ Incheon	19	198	-
▪ Taegu	14	152	207
▪ Kyunggi	38	722	194
▪ Kangwon	8	57	70
▪ Chungbuk	9	58	73
▪ Daejeon	15	133	-
▪ Chungnam	7	86	120
▪ Junbuk	13	83	85
▪ Kwangju	12	81	147
▪ Junnam	9	69	-
▪ Kyungbuk	19	101	-
▪ Kynugnam	15	130	168
▪ Jeju	7	27	46

*Based on the 10 local banks name instead of their actual presence of all the branch offices.

Table F: Loans of Deposit Money Banks by Size of Firms (billion won)

	End of 1997 (A)	End of 1998 (B)	B – A
Total	200,401.1	199,596.0	-804.2
▪ SMEs	101,144.0	90,752.2	-10,391.8
▪ Non-SMEs	99,257.1	108,847.7	+9,587.6

Table G: Corporate Bankruptcies by Type (numbers)

	1996	1997	1998	98. I	98. II	98. III	98. IV
Corporations	5,157	8,226	10,536	4,291	2,855	2,039	1,351
▪ Large firms	7	58	39	16	8	8	7
▪ *SMEs*	*5,150*	*8,168*	*10,497*	*4,275*	*2,847*	*2,031*	*1,344*
Households	6,432	8,942	12,292	5,158	3,502	2,182	1,450
Total	11,589	17,168	22,828	9,449	6,357	4,221	2,801

Figure A: Change in Industrial Production (year-on-year)

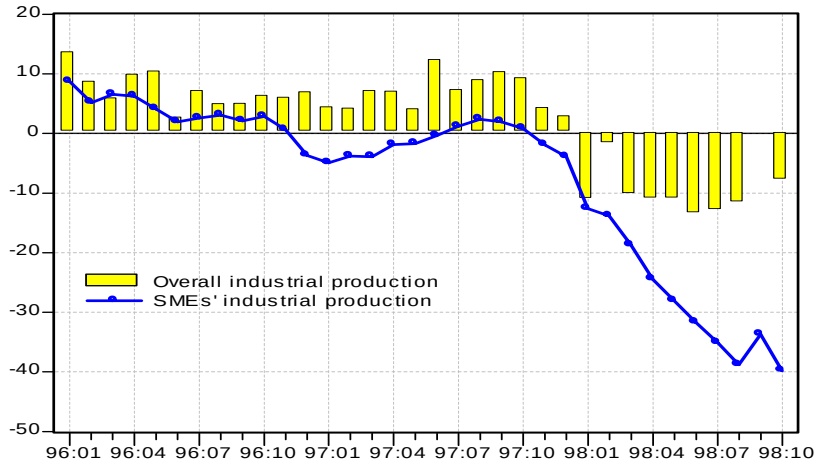

Table I: Overview of the Korean Financial System (as of end 1996)

Number of institutions	Commercial banks	Merchant Banking Corporations	Mutual Savings and Finance Companies
Total system	28	30	226
Our sample	28	23	226
% coverage	100%	77%	100%

Table II: Sample Frequency Distribution
Distressed versus non-distressed institutions

	Freq.	Percent
Non-distressed	210	75.81
Distressed:	67	24.19
1 Total larger-sized intermediaries of which:	*31*	*46.27*
Commercial banks	*18*	
Merchant Banking Corporations	*13*	
2 MSFCs	*36*	*53.73*
Total	277	100.00

Table III: Variables Definition

Variable	CAMEL category	Definition
EQ_LOA	Capital	Equity (book value) / Total loans
EQLLR_TAS	Capital	(Equity (book value) + Loan loss reserves)/Total assets
EQLLR_LOA	Capital	(Equity (book value) + Loan loss reserves)/Total loans
LR_EQLLR	Asset quality (risk)	Loan Loss Reserve/(Equity + Loan Loss Reserve)
LOANGROWTH	Asset quality (risk)	Growth rate of loans between 1995 and 1996 (March/June1997 on March/June 1996 for those institutions for which the fiscal year closes in March, December 1996 on December 1995 for the others)
LOA_TAS	Asset quality (risk)	Loans / Total assets
PROV_LOA	Asset quality (risk)	Provisioning / Average total loans
INEFFRATIO	Management	Total operating expenses/Total revenues
CORGOV	Management	Dummy variable which takes the value of 1 if the intermediary is private-owned, and 0 otherwise (i.e., if it is state-owned)
ROA	Earnings	Net income/Total average assets
ROE	Earnings	Net income/Total average equity
LIQ_TASS	Liquidity	Liquid assets / total assets
LOANS_BORROWING	Liquidity	Total loans/Total borrowings (deposits and other sources of borrowing)
SIZE	-	Logarithm of total assets
CONNECT	-	Dummy variable which takes the value of 1 if the intermediary is owned by a family or belongs to an industrial conglomerate (Chaebol) or other financial institutions, and 0 otherwise
MSFC	-	Dummy variable which takes the value of 1 for an MSFC institution, and 0 otherwise
CHAEBOL (1)	-	Dummy variable which has a value of 1 if an MSFC is owned by a *chaebol* and 0 otherwise
FI (1)		Dummy variable which has a value of 1 if an MSFC is owned by a financial institution (commercial bank or non-bank financial institution) and 0 otherwise
FAMILY (1)		Dummy variable which has a value of 1 if an MSFC is owned by a family and 0 otherwise
SEC_TASS (1)	-	Securities / Total assets
DEPA_TD (1)	-	Ratio of credit mutual installment savings to total deposits
LARGE (1)	-	Dummy variable which has a value of 1 if an MSFC's size is larger than the median size of the sample, and 0 otherwise
YEARS (1)	-	Length of business history for an MSFC
(1) variables computed for the MSFC sample		

Table IV: Ownership structure of financial institutions in the sample

	Private-owned	**State-owned**	**Connected**	**Independent**
MSCFs	226	0	194	32
Larger-sized institutions	46	5	18	33
Total	272	5	212	65

Table V: Ownership structure of MSFCs

	Total number	**Industrial group (*chaebols*)**	**Financial institution**	**family (concentrated ownership)**	**widely-held**
MSFCs	226	10	33	151	32

Table VI: Regression Specifications and Expected Results

Variable	Camel definition	Expected impact on FAILURE
SIZE	-	(-) *Diversification or Credit Channel Effects intervention or TBTF*
(Equity + Loan Loss Reserve)/ Total Assets (Equity + Loan Loss Reserve)/ Loans Equity/ Loans	Capital	*(-) cushion to absorb shocks*
Loan Loss Reserve/ (Equity + Loan Loss Reserve) Provisions / Total loans	Asset quality/Risk	*(+/-) aggressive provisioning policy as signal of high credit risk* or *of build up of an appropriate stock of general provisions*
Loan growth Loans / Total Assets	Asset quality/ Risk	(+) *Risk, Misallocation*
Expenses/ Total Revenues	Management	(+) *Inefficiency*
Corporate governance	Management	(-/+) *Inefficiency* or *Flight to Safety*
Connected	Management	(+/-) *Misallocation* or *Political connections*
Return on assets Return on equity	Earnings	(-) *Profitability*
Loans/ Borrowings Liquid assets / Total assets Securities / Total assets (only for MSFCs)	Liquidity	*(+) more liquidity risk (for the first variable)* *(-) less liquidity risk (for the second and third variable)*
MSFC	-	(+) *Credit Channel Effects intervention or TBTF*
Chaebol	-	*(+/-) Misallocation* or *Political connections*
FI	-	*(+/-) Misallocation* or *Political connections*
Family		*(+/-) Misallocation* or *Political connections*
Securities / Total Assets	-	*(-) safer assets*
Large	-	*(-) Diversification*
Years	-	*(-) longer business history in local community as signal for keeping closer to origin*
Credit mutual installment savings / Total deposits	-	*(-) peer monitoring reduces risk*

Table VII: Summary Statistics (Entire Sample of 277 Financial Institutions) (Median Values)

	All institutions	Large-size	Small-size (MSFCs)	Connected institutions	Not connected institutions	Distressed institutions	Non-distressed institutions
EQ_LOA	0.106	0.142***	0.102	0.105	0.113	0.106	0.106
EQLLR_TAS	0.081	0.072***	0.085	0.085**	0.076	0.071***	0.0857
EQLLR_LOA	0.119	0.161***	0.1147	0.118	0.128	0.118	0.120
LR_EQLLR	0.124	0.118*	0.1276	0.121	0.130	0.124	0.124
LOA_TASS	0.729	0.445***	0.753	0.736***	0.628	0.579***	0.745
LOANGROWTH	0.079	0.095	0.078	0.074	0.095	0.063	0.081
PROV_LOA	0.004	0.007***	0.003	0.004***	0.006	0.004	0.004
INEFFRATIO	0.065	0.776***	0.604	0.644	0.725	0.760***	0.602
CORGOV (1)	0.982	0.902***	1	1.***	0.921	0.940***	0.995
ROA	0.006	0.004***	0.007	0.008	0.006	0.003***	0.007
ROE	0.092	0.060***	0.103	0.092	0.086	0.049***	0.104
LIQ_TASS	0.095	0.149***	0.088	0.094	0.114	0.111	0.091
LOANS_BORROWING	0.929	0.586***	0.961	0.943	0.762	0.743***	0.946
SIZE (log tot assets)	11.91	14.96***	11.75	11.81***	13.91	12.659***	11.85
CONNECT(1)	0.77	0.916***	0.476	-	-	0.716	0.790
DISTRESS	0.242	0.916***	0.476	0.217**	0.323	-	-
MSFC	0.816	-	-	0.916***	0.476	0.537***	0.905

Whereas column 2 refers to the whole sample, columns 3-8 present medians (means) for three different bi-partition of the whole sample. Specifically in columns 3 and 4 intermediaries are grouped within “large-size” and "small size " according to whether their belonging to the group "commercial banks, merchant banking corporations" or the group "mutual savings and finance companies". Columns 5 and 6 divide the sample among connected and non connected institutions. Columns 7 to 8 partition the sample according to whether an intermediary went under distress or not.

(1): mean values

A Mann-Whitney (t-test) test for differences in medians (means) is applied across relevant bi-partitions:

*** indicates that the difference in medians (means) is significantly different from zero at the 1% level or less

** indicates that the difference in medians (means) is significantly different from zero at the 5% level or less

* indicates that the difference in medians (means) is significantly different from zero at the 10% level or less

Table VIII: Summary Statistics for MSFCs

	All MSFCs	Distressed	Non-Distressed	Chaebol owned	Non-Chaebol owned	Family owned	Non-family owned	FI owned	Non-FI owned
EQ_LOA	0.102	0.093**	0.104	0.121	0.102	0.102	0.105	0.112	0.100
EQLLR_TA	0.085	0.072***	0.086	0.096	0.085	0.085	0.084	0.092	0.085
EQLLR_LOA	0.115	0.106**	0.117	0.113	0.115	0.114	0.117	0.122	0.114
LR_EQLLR	0.128	0.134	0.127	0.104	0.128	0.123	0.132	0.132	0.127
LOA_TASS	0.753	0.726	0.754	0.731	0.754	0.751	0.755	0.736	0.755
LOANGROWTH	0.078	0.052	0.078	0.068	0.078	0.069	0.081	0.077	0.078
PROV_LOA	0.003	0.003**	0.004	0.004	0.003	0.003	0.004	0.003	0.003
INEFFRATIO	0.604	0.771***	0.588	0.536	0.604	0.601*	0.612	0.884***	0.093
ROA	0.007	0.001***	0.008	0.009	0.007	0.007	0.006	0***	0.007
ROE	0.103	0.017***	0.118	0.113	0.104	0.118**	0.086	0***	0.119
LIQ_TASS	0.087	0.083	0.089	0.125	0.088	0.092**	0.008	0.087	0.089
LOA_BOR	0.961	0.935	0.962	0.913	0.961	0.956*	0.977	0.969	0.961
SIZE (log tot assets)	11.75	11.67	11.79	12.49**	11.74	11.68**	11.91	12.03**	11.72
YEARS	24	15***	24	25	24	24	24	23	24
DEPA_TD	0.093	0.076***	0.097	0.078	0.093	0.094	0.084	0.070***	0.097
LARGE	0.5	0.38	0.52	0.7	0.49	0.43***	0.64	0.69**	0.47
SEC_TASS	0.023	0.016.	0.025	0.031	0.022	0.023	0.025	0.019	0.024
FI	0.146	0.278**	0.121	0	0.154	0	0.452	-	-
CHAEBOL	0.045	0	0.052	-	-	0	0.137	0	0.052
FAMILY	0.677	0.694	0.674	0	0.706	-	-	0	0.793
DISTRESS	0.159	-	-	0	0.159	0.163	0.151	0.303***	0.135

Whereas column 2 refers to the whole sample, columns 3-10 present medians (means) for four different bi-partition of the whole sample. Specifically columns 3 and 4 partition the sample according to whether an intermediary went under distress or not. In columns 5 to 6 intermediaries are grouped within “chaebol-owned” and "non chaebol " according to whether their belonging to an industrial conglomerate or not. Columns 7 and 8 divide the sample among family-owned and non family-owned. Columns 9 to 10 partition the whole sample according to their belonging to a financial conglomerate or not

(1): mean values

A Mann-Whitney (t-test) test for differences in medians (means) is applied across relevant bi-partitions:

*** indicates that the difference in medians (means) is significantly different from zero at the 1% level or less

** indicates that the difference in medians (means) is significantly different from zero at the 5% level or less

* indicates that the difference in medians (means) is significantly different from zero at the 10% level or less

Table IX: Regression Results for Distress Based on the Whole Sample of Korean Financial Intermediaries

(Equity + Loss Reserves) / Total Assets	-24.86
	(0.00)
Loan Growth	-3.12
	(0.00)
Return On Assets	-109.99
	(0.09)
Connect	0.87
	(0.06)
MSFC	-2.35
	(0.00)
Number of Observations	277
Chi2 (5); Prob > chi2	49.12; (0.00)
pseudo R2	26.56%
Overall predictive power	83.75%
Memorandum: Other variables found statistically significant	
SIZE	+***

*** Indicates statistically significant at the 1% level or less.

Table X: Regression Results for Distress Based on the Sample of MFSCs

(Equity + Loss Reserves) / Total Assets	-35.82
	(0.00)
Loan Growth	-3.51
	(0.00)
Depa_Td	-11.74
	(0.05)
Years (in business)	-0.07
	(0.04)
FI	2.52
	(0.03)
FAMILY	1.82
	(0.09)
Securities / Total Assets	-12.75
	(0.05)
Large	-0.60
	(0.17)
Number of Observations	226
Chi2 (8); Prob > chi2	43.39; (0.00)
pseudo R2	27.10%
Overall predictive power	85.84%